

A. 35 U.S.C. §102(b) Rejection

Claims 9-13 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 3,469,950 to Mackley ("Mackley") entitled "fixed-bed catalytic operations". The rejection is respectfully traversed.

It is well established that to anticipate a claim, a reference must disclose every element of the claim. *Verdegaal Bros. v. Union Co. of California*, 2 USPQ 2d 1051, 1053 (Fed. Cir. 1987). Moreover, the identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ 2d 1913 (Fed. Cir. 1989).

Applicants respectfully submit that Mackley does not include all of the limitations of amended claims 9-12 and new claims 14-20. Claim 13 was cancelled. For example, Mackley does not disclose the limitation of amended independent claims 9 and 12 that the bypassing step includes the use of a bypass device that comprises a bypass tube (or second hollow elongated member) inside a cage (first elongated hollow member) wherein the cage has a substantially larger cross-section than the bypass tube.

Figure 2 of Mackley, shows a bypass device consisting of two baskets connected by a blanking plate. The two baskets are cylindrical having the same diameter and are push fitted together. See *Id.*, at col. 2, line 6 - line 11. Unlike the Mackley device the bypass device employed in the method of the present invention includes a bypass tube disposed within a larger cross-section cage member. The bypass tube protrudes through the top wall of the cage member and extends above the catalyst bed. The bypass tube also is sized to provide a flow restriction into the cage and thus regulate the flow of the feedstock into the cage. In operation, the flow of the feedstock through the bypass tube increases as the top of the catalyst bed fouls. The cage on the other hand is sized primarily to maintain sufficiently low exit velocity for the bypassed feedstock exiting through the cage perforations. Thus, unlike Mackley, the present invention method employs a bypass apparatus that has a tube inside a cage design wherein the cross-section of the cage is substantially larger than the cross-section of the bypass tube. The bypass tube is sized to regulate the flow of the feedstock into the cage whereas the cage has a substantially larger cross-section than the bypass tube to effectively reduce the exit velocity of the bypass flow from the cage into the bottom layer of the fixed bed.

The absence of even a single claim limitation in a prior art reference defeats anticipation. Here, Mackley fails to disclose at least the above limitation of amended independent claims 9 and 12. For at least this reason, it is respectfully submitted that Mackley does not anticipate amended claims 9 and 12, and all claims depending therefrom.

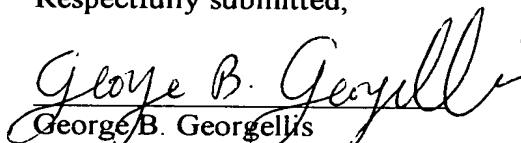
B. Objections under 35 USC § 132 and Claim Rejections Under 35 USC § 112

In view of the above amendments to the claims and the specification Applicants request reconsideration and withdrawal of the new matter objections and indefiniteness rejections to the claims and the specification.

CONCLUSION

This Amendment places the application in condition for allowance. If the Examiner believes that prosecution and allowance of the application will be expedited through an interview, whether personal or telephonic, the Examiner is invited to telephone the undersigned with any suggestions leading to the favorable disposition of the application.

Respectfully submitted,



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☒ Pursuant to 37 CFR 1.34(a)

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AMENDED SPECIFICATION WITH MARKINGS

Amend the following paragraph which was added by Applicants' amendment dated October 5, 2001 to page 6, line 8, of the Specification immediately following the sentence ending with "into the catalyst bed to different depth."

An embodiment of the invention is directed to a fixed bed reactor 6 for reacting a feedstock. The reactor 6 comprises a fixed catalyst bed 5 and a bypass device positioned or disposed within the fixed catalyst bed 5. The bypass device comprises a first elongated hollow member (also referred to as a "cage member" or "cage") 2 having a top wall, side walls, a bottom wall and a plurality of apertures or openings disposed generally near a lower end or section of cage 2. The bypass device further comprises a second elongated hollow member 1 disposed within cage 2 and protruding or extending through the top wall of cage 2. The second elongated member 1 extends above the catalyst bed 5. The cage member 2 has an upper enclosed portion (top wall and upper portion of the side walls) 3 and a lower perforated portion (bottom wall and lower portion of side walls) 4. Optionally, the second hollow elongated member 1 may have a cap 7 over the end or portion of member 1 that extends above the catalyst bed 5. The Figure also shows an optional layer of inert material 8 disposed within the catalyst bed in which the bypassed material is distributed. The first and second elongated hollow members may be tubular members with the first elongated hollow member 1 positioned or disposed within the second elongated hollow member as shown in the Figure. [In operation, the first elongated hollow member receives a portion of the feedstock and directs it into the second elongated member whether it is discharged through the openings of the cage into the catalyst bed 5.] In operation, the bypass tube receives a portion of the feedstock and directs it into the cage where it is discharged through the openings of the cage into the catalyst bed 5.

AMENDED SPECIFICATION WITH MARKINGS (continued)

Replace the paragraph beginning at page 7, line 15, with the following rewritten paragraph:

--One or more bypass apparatus may be utilized in any given bed. The cage member may extend through the catalyst bed to the same or different depths within the beds bottom layer. [The bypass apparatus utilized herein] The bypass apparatus of the present invention employs an elongated member or tube disposed within a substantially larger cross-section, perforated cage member, as shown in the sole drawing of the application, to maintain the catalytic bed integrity and prevent the high exit velocities of the second elongated member from eroding the bed or causing the bed to slump, increase pressure drop, and deteriorate unit performance.--

AMENDED SPECIFICATION WITH MARKINGS (continued)

Amend paragraph beginning at page 8, line 1, with the following rewritten paragraph:

--catalyst bed is clean and no foulants have deposited at the bed top, a majority of the flow will go through the catalyst bed instead of the bypass apparatus. This is because the bypass apparatus, particularly the second hollow elongated member, typically tubes, are sized to have a significantly high pressure drop relative to the clean bed, and the flow takes the path of least resistance. The second hollow elongated members are typically sized to provide a pressure drop of a factor of about 5 to about 50 times or of about 5 to about 25 higher relative to the clean bed. As the bed top fouls during operation, the resistance to flow through the bed increases, and an increasing fraction of the flow is bypassed through the bypass apparatus. Thus, the second hollow elongated members, typically tubes, are sized to have a flow resistance which is significantly higher than the flow resistance of the clean bed. As an example, the pressure drop through a clean (unfouled) top four feet layer of the catalyst bed would be typically 0.5 to 2 psi in a typical hydroprocessing reactor. Depending upon the operation, the bypass tubes will be sized to have a flow resistance of about 10 to 50 psi with total flow in the tubes. With this bypass arrangement, the pressure drop through the top four feet section of the bed will never exceed 50 psi. If the bypass tubes were not used, the pressure drop could be significantly higher than 50 psi upon fouling which would necessitate a reactor shutdown or throughput reduction.--